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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,601	05/09/2001	Timothy W. Skszek	POM-12102/29	2583

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EXAMINER
FULLER, ERIC B

ART UNIT	PAPER NUMBER
1762	X

DATE MAILED: 10/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,601	SKSZEK ET AL.	
	Examiner	Art Unit	
	Eric B Fuller	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 1-6 are objected to because of the following informalities:

In claim 1, "A improved tooling" should read "An improved tooling".

Claim 4 is confusing, specifically around the phrase "in interface" and "to interface".

In claim 5, "is die-cast" should read, "is a die-cast".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1-5, "the tooling" lacks antecedent basis.

In claims 3 and 4, the limitation of "deposited relative to" is vague. It is not understood what this adds to the claim. In what relation does "relative to" comprise? It is not known how a deposition can take place without being, in some sense, relative to these parts.

Also in claim 4, it is the position of the examiner that "interface associated with opening and closing" is vague. It is unclear how it is associated. Also, what is being opened and closed? The specification provides two different interpretations of the word "interface". Is the interface part of the CAD and it is the feedback loop that is being opened and closed? Or is the interface a part of the tool and it is the tool that is being opened and closed at the spot of the interface?

In claim 5, it is the examiner's position that the phrase "is used in conjunction with the fabrication..." is vague. It is unclear how the material is used.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kar et al. (US 6,203,861 B1).

Kar teaches a process of manufacturing 3-D objects by a laser deposition method. Metal particles are directed to the substrate and a laser is used to melt the

particles into the object (column 4, lines 7-55). The object created may be a tool for die-casting (column 2, line 61; column 1, lines 55-60). The deposition is graded by depositing different materials in different areas (column 3, lines 1-8).

It is noted that it appears from the specification that by "laser-assisted direct metal deposition", the applicant is referring to a process that produces a melt pool larger than that of "laser cladding" (pages 3 and 4 of the specification). However, it is the examiner's position that there is no clear distinction between a DMD process and laser cladding defined in the art and no definition of DMD given in the specification. Therefore, without limitations drawn to the method of DMD (including forming a substantially large melt pool), the claims are open to any laser deposition method that involves directing metal to a substrate.

Kar fails to explicitly teach the formation of a melt pool, however, as explained above, the laser deposition method of Kar still reads on a direct metal deposition as the laser of Kar is directed towards a substrate and metal particles are directly deposited.

It is further noted that although the melt pool is not explicitly taught by Kar, it may be implied by the teaching that the invention can be used to perform alloying of the substrate (column 8, lines 25-30).

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Lewis et al. (US 5,837,960).

Lewis teaches a process where a laser forms a melt pool into an object and metal particles are directed into the melt pool (column 4, lines 22-50). The object

formed is a tool or die (column 4, lines 8-10). The deposition is graded by depositing different metals or ceramics into different areas (column 21, lines 39-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,875,830) in view of Lewis et al. (US 5,837,960).

Singer teaches a tool that is used for high-pressure die-casting (column 2, lines 1-5). The tool of Singer comprises a gate area and requires differing metals to be applied around the cooling channels and gates as opposed to the rest of the tool in order to increase thermal conductivity. Grading is used to connect the two areas (column 3, lines 15-35). Singer fails to teach forming the tool by the method taught by Lewis.

However, Lewis teaches a process of forming gradient structures that may be tools or dies, as explained above. The benefits of Lewis are that it provides rapid prototyping and production (column 2, lines 19-57). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to produce the tool of Singer by the process according to Lewis. By doing so, prototyping and production times are decreased.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,875,830) in view of Kar et al. (US 6,203,861 B1).

Singer teaches a tool that is used for high-pressure die-casting (column 2, lines 1-5). The tool of Singer comprises a gate area and requires differing metals to be applied around the cooling channels and gates as opposed to the rest of the tool in order to increase thermal conductivity. Grading is used to connect the two areas (column 3, lines 15-35). Singer fails to teach forming the tool by the method taught by Kar.

However, Kar teaches a process of forming gradient structures that may be tools or dies, as explained above. The benefit of Kar is that it provides rapid production, as it is a one-step process (column 3, lines 9-40). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to produce the tool of Singer by the process according to Kar. By doing so, production time is decreased.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (US 5,837,960), or Singer et al. (US 5,875,830) in view of Lewis et al. (US 5,837,960), as applied to claim 1 above, and further in view of Weiss et al. (US 5,189,781).

Both Lewis and Singer in view of Lewis teach a process for forming tools or dies by laser-assisted DMD. However, it is not taught that the tool may be opened or closed and the material deposited is done so relative to the interface. However, Weiss teaches

that tools may be formed in halves that can open and close in order to remove the part produced by the tool (column 3, lines 40-58). To provide opening and closing means to the tool produced by Lewis, or Singer in view of Lewis, would have been obvious at the time the invention was made to a person having ordinary skill in the art. By doing so, the part produced by the tool may be removed.

As shown above, claim 4 is vague in that it is not explained how the deposition is "relative". Further, without any difference being made between the first and second material, the gradient of Lewis reads on depositing relative to the interface. In cases where "relative" is explained and differences are made between the first and second materials, the areas of the interface not comprising channels would be made of the less thermally conductive material, as taught by Singer.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kar et al. (US 6,203,861), or Singer et al. (US 5,875,830) in view of Kar et al. (US 6,203,861 B1), as applied to claim 1 above, and further in view of Weiss et al. (US 5,189,781).

Both Kar and Singer in view of Kar teach a process for forming tools or dies by laser-assisted DMD. However, it is not taught that the tool may be opened or closed and the material deposited is done so relative to the interface. However, Weiss teaches that tools may be formed in halves that can open and close in order to remove the part produced by the tool (column 3, lines 40-58). To provide opening and closing means to the tool produced by Kar, or Singer in view of Kar, would have been obvious at the time

the invention was made to a person having ordinary skill in the art. By doing so, the part produced by the tool may be removed.

As shown above, claim 4 is vague in that it is not explained how the deposition is "relative". Further, without any difference being made between the first and second material, the gradient of Lewis reads on depositing relative to the interface. In cases where "relative" is explained and differences are made between the first and second materials, the areas of the interface not comprising channels would be made of the less thermally conductive material, as taught by Singer.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,875,830) in view of Lewis et al. (US 5,837,960), as applied to claim 1 above, and further in view of Thompson (Handbook).

Singer and Lewis teach the limitations of claim 1, as shown above. Further, it is taught by Singer that the high-pressure die-casting tool uses different metals in different places throughout the tool in order to impart different characteristics to different areas (column 2, lines 1-5; column 3, lines 15-20). The reference fails to teach using H19 steel around the gate area and H13 steel around the bulk of the tool. However, Thompson teaches that H13 steel is commonly used as the metal for die-casting (page 24, table 3.2). Thompson additionally teaches that H19 steel is commonly used for hot working extrusions (page 25, table 3.2 continued), such as that experienced around the gate of a high-pressure die-casting tool. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize H19

steel near the gate of the tool formed by Singer in view of Lewis and H13 steel in the other areas. By doing so, steel that is better suited for handling the temperature and pressure at the gate is used where it is needed.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,875,830) in view of Kar et al. (US 6,203,861 B1), as applied to claim 1 above, and further in view of Thompson (Handbook).

Singer and Kar teach the limitations of claim 1, as shown above. Further, it is taught by Singer that the high-pressure die-casting tool uses different metals in different places throughout the tool to impart different characteristics to different areas (column 2, lines 1-5; column 3, lines 15-20). The reference fails to teach using H19 steel around the gate area and H13 steel around the bulk of the tool. However, Thompson teaches that H13 steel is commonly used as the metal for die-casting (page 24, table 3.2). Thompson additionally teaches that H19 steel is commonly used for hot working extrusions (page 25, table 3.2 continued), such as that experienced around the gate of a high-pressure die-casting tool. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize H19 steel near the gate of the tool formed by Singer in view of Kar and H13 steel in the other areas. By doing so, steel that is better suited for handling the temperature and pressure at the gate is used where it is needed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Johnson et al. (US 4,966,225) and Sandberg et al. (US 6,365,096 B1) are considered pertinent to the applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

EBF
September 26, 2002

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